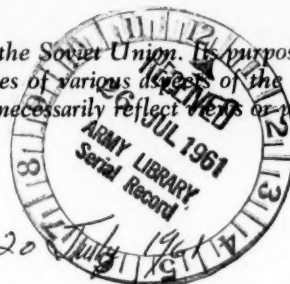


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Outline Of Reference Paper On:

No. 41, 1960/61

A DRASTIC OVERHAULING OF SOVIET SCIENTIFIC RESEARCH

A thorough reorganization of Soviet science has been initiated to eliminate duplication and other types of inefficiency. In an associated move, the functions of the Soviet Academy of Sciences have been streamlined.

The reason for the reorganization emerged from a conference of scientists from all republics, at which many aspects of Soviet science were criticized.

It appears that the reorganization project is based mainly on two principles: (1) subordination of all branches of science to "the building of Communism"; and (2) an all-out effort by science to eliminate obstructions in the way of the Soviet economy.

Further, the conference named the areas of research that are vital to the development of Communism and spelled out the scientific problems whose solution the Kremlin finds essential for Soviet internal and foreign policy.

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No. 41, 1960/61

A DRASTIC OVERHAULING OF SOVIET SCIENTIFIC RESEARCH

A number of recent decrees and actions reported in the Soviet press indicate that the Soviet leaders have embarked on a thorough reorganization of scientific research. The decree of April 3, published in *Izvestia* on April 12, 1961, stressed three main goals: to eliminate duplication in research, to establish a system of all-round supervision and co-ordination, and to perfect a system of research planning. The decree created a state committee to "guide the work of the research institutions... in accordance with the directives of the Party and the government... and also to eliminate all hitches from research work and from the application of its results in the economy" (*ibid.*).

The decree also introduced various changes in the functions of the Academy of Sciences of the USSR. All associate branches and numerous affiliated institutes were removed from the Academy's control and transferred to various state committees of the Council of Ministers of the USSR and of the RSFSR. The Academy has retained control only of work methods, and research in the natural sciences and the humanities.

Despite the claims of Soviet propaganda that Soviet science is the most advanced in the world, the decree admits that there is a considerable lag in some branches and calls for a struggle to occupy "the leading position in the world in all branches of science and technology." The delay in the publication of the decree was caused presumably by disagreements over the problems under discussion.

A conference of scientists from all republics held from June 12 to 14, was attended also by Party and government members, including Khrushchev. The conference heard a report by Mstislav V. Keldysh, the new President of the Soviet Academy of Sciences, on "Soviet science and the building of Communism," and one by member of the Central Committee

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Presidium and First Deputy Chairman of the Council of Ministers Aleksei N. Kosygin, on fashioning "a close link between science and life." This report outlined the steps involved in the organization of research work. Analysis of both reports and of the conference proceedings provides the reasons for the reorganization. They include: arbitrary selection of research projects, which are often of personal interest to individual scientists or groups of scientists but of little interest for the development of the economy, duplication and lack of co-ordination of research, waste, and the need for some form of supervision of plan fulfillment. Many research projects are but crawling along. According to Kosygin's report,

In 1960, out of 891 important research projects provided in the state plan for the introduction of new technology, only 574 projects (64 per cent) are completely finished, while on 54 projects work has not even begun. . . . Snags in the work on several important economic problems are holding up the development of some branches of industry (Pravda, June 15, 1961).

The Party has established two main principles as the basis of the reorganization of scientific work: (1) subordination of all branches of science to the practical task of Communist construction; (2) all-round industrialization of science, or the concentration of research on the main problems in the way of development of Soviet economy.

Having subordinated the development of science to Marxism-Leninism, the Party leaders listed the areas on which research shall be concentrated in the period of the all-out building of Communism. They are:

Power engineering. Theoretical and experimental research in nuclear physics, the development of controlled thermonuclear reactions, the study of high-temperature plasma, work on the improvement of nuclear power plants (Izvestia, June 13, 1961, Keldysh).

Automation. The study of its effectiveness in industry and the determination of the fields of endeavor which can make use of automation (Pravda, June 15, 1961, Kosygin); the automation of various forms of mental tasks which can be expressed as a series of logical and mathematical operations; the development of self-correcting systems; and the transfer of information not only in earthbound automation equipment but also over large distances in space (Izvestia, June 13, 1961).

Electronics. Utilization of newly discovered properties of semiconductors and dielectrics and the use of atomic phenomena for the exact

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measurement of time; the use of newly discovered properties of crystals; the study of the properties of electric plasma; the problems of miniaturizing, or reducing the size of electronic apparatus; the utilization of new electromagnetic frequency bands; the study of infra-red and visible wave bands; the creation of quantum-mechanical generators and visible band amplifiers and research into various types of monocrystals (ibid.).

Mathematics. Development of the theory of control processes, the creation of logical equipment, the theory of reliability, and the theory of probability (ibid.).

Solid state physics and the creation of new materials. Much research is needed in this area--one of the most important in present-day physics. There is to be research into the properties of crystals as part of the problem of miniaturizing radio and technical equipment. Also to be examined are interactions of metals in Mendeleyev's periodic table of elements. Research shall be concentrated on materials resistant to heat, corrosion and radiation (ibid.).

Chemistry. "The search for cheap forms of raw materials, the creation of new, simple, and economical technological processes..., attaining great purity and high quality of a product," are of prime importance. Other projects will include research on how to extend the application of and how to perfect the existing polymers; the study of macro-structures, and the creation of the necessary theoretical basis to process polymers as products; research on new types of high-molecular compounds. There is to be research into the properties of various elements in the periodic table and their compounds, with special emphasis on the rare elements. Other problems concern pure substances, new types of fuel, and work on combustion processes for high-altitude planes and missiles.

Biological, agricultural and medical sciences. First of all, co-operation is needed between these sciences. New highly productive types of crops are to be cultivated and new breeds of livestock raised. More effective methods of working the soil and tending plants are to be developed. Also needed are methods of treatment and prevention of diseases. More work is needed on the treatment and prevention of cardiovascular diseases. The Soviets intend to undertake research into the causes of cancer, a comprehensive study of proteins and nucleic acids of viruses, and work in the field of cosmic biology (ibid.).

Earth and space. The study of the ionosphere is needed to understand the behavior of radio waves; other tasks include the study of the sun's corpuscular beams and their interaction with the earth's magnetic pole, the study of the earth's radiation belts, of the nature of the increases in the intensity in cosmic radiation, and of thermonuclear processes taking place in the interiors of stars.

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Social and economic sciences. There is to be research, according to the Party leaders, on the development of human society toward Communism; a basis for the planned development of the economy and culture should be worked out and the Communist man trained; the struggle against present-day bourgeois ideology intensified. In economics, a study of the world market will be undertaken with attention devoted to supply and demand, price formation, the organization of production, economic stimulation of labor. "Economic research must precede planning and form its basis" (Pravda, June 15, 1961, Kosygin).

One of the interesting insights gained from the various measures and decisions in the reorganization program is that Soviet science is lagging behind the West in some branches, and that there is a gap between individual achievements and the general level of research. This conclusion is confirmed by the directive calling for a careful study of the scientific work of foreign countries and its application on a broad scale, and an exchange of licenses with the capitalist countries:

Our research institutes must be better acquainted with achievements abroad. However, research institutes must, when beginning work on a scientific or technical problem, take into consideration the possibility of patenting and selling our licenses abroad. These sales may in turn become an additional source of revenue for the purchase of foreign licenses (ibid.).

An interesting point is that the famous and controversial academician Trofim D. Lysenko did not speak at the conference, though it discussed improvements in agriculture. Another interesting point is that the national conference gave various scientists the opportunity to defend their right to freedom of choice in research work.